

BIOFERTILIZER SEBAGAI AGEN BIOREMEDIASI RESIDU SENG (Zn) PADA LAHAN TANAMAN CABAI RAWIT (*Capsicum frutescens* L.) PASCA APLIKASI PESTISIDA ANORGANIK SKALA LAPANG

Ronald Wihan Pradana

21/474919/BI/10720

Dosen Pembimbing: Dwi Umi Siswanti S.Si, M.Sc.

INTISARI

Bioremediasi adalah teknologi yang mempercepat proses alami untuk menurunkan efek toksik bahan kimia berbahaya menggunakan tumbuhan, alga atau bakteri. *Biofertilizer* adalah formulasi biologis kompleks yang merupakan kombinasi mikroorganisme hidup yang memiliki produk metabolisme spesifik yang mempengaruhi tanaman dan meningkatkan kualitas tanah. Penelitian ini bertujuan untuk menganalisis tingkat residu (seng) Zn setelah aplikasi biofertilizer pada lahan tanaman cabai rawit pasca pengaplikasian pestisida anorganik, menganalisis respons fisiologis tanaman cabai rawit terhadap biofertilizer pasca aplikasi pestisida anorganik, dan menganalisis aktivitas enzim *Superoxide dismutase* (SOD) tanaman cabai rawit terhadap biofertilizer pasca aplikasi pestisida anorganik. Perlakuan terdiri dari aplikasi *biofertilizer* 10 L/ha, 15 L/ha dan 20 L/ha serta kontrol (tanpa aplikasi *biofertilizer*). Pestisida anorganik diaplikasikan dengan dosis 2gr/liter. Parameter yang diukur berupa parameter lingkungan (pH, suhu, intensitas cahaya dan kelembaban), tinggi tanaman, jumlah daun, berat basah, berat kering, dan rasio tajuk:akar, kadar klorofil, kandungan (SOD) serta analisis Zn pada media tanam. Kesimpulan penelitian ini residu Seng (Zn) dalam media tanam setelah pengaplikasian pestisida anorganik dari 47,77 mg/kg turun sebesar 12,32 % menjadi 39,26 setelah penambahan *biofertilizer*. Respons tanaman pasca aplikasi *biofertilizer* pada parameter pertumbuhan menaikkan tinggi tanaman, dan jumlah daun, pada parameter perkembangan mempercepat waktu pembungaan, dan pada parameter produktivitas menaikkan berat basah, berat kering, dan berat total tanaman, serta menaikkan kadar klorofil pada daun. Aktivitas enzim *Superoxide dismutase* (SOD) pada tanaman cabai rawit pasca aplikasi biofertilizer menunjukkan tanaman cabai rawit tidak tercekaman oleh residu pestisida anorganik, namun pengaplikasian biofertilizer dapat meningkatkan aktivitas enzim *superoxide dismutase* (SOD) pada daun tanaman cabai rawit.

KATA KUNCI : *Biofertilizer*, Bioremediasi, Pestisida, Logam berat, Seng

**BIOFERTILIZER AS A BIOREMEDIATION AGENT FOR
ZINC (Zn) RESIDUES IN CAYENNE PEPPER
(*Capsicum frutescens* L.) FIELDS AFTER INORGANIC
INSECTICIDE APPLICATION AT FIELD SCALE**

Ronald Wihan Pradana

21/474919/BI/10720

Supervisor : Dwi Umi Siswanti S.Si, M.Sc.

ABSTRACT

Bioremediation is a technology that accelerates natural processes to reduce the toxic effects of hazardous chemicals using plants, algae, or bacteria. Biofertilizer is a complex biological formulation that is a combination of living microorganisms that have specific metabolic products that affect plants and improve soil quality. This study aims to analyze the level of zinc (Zn) residue after biofertilizer application in chili plant land after the application of inorganic pesticides, analyze the physiological response of chili plants to biofertilizers after the application of inorganic pesticides, and analyze the activity of the Superoxide dismutase (SOD) enzyme in chili plants in response to biofertilizers after the application of inorganic pesticides. Parameters measured include environmental parameters (pH, temperature, light intensity, and humidity), plant height, number of leaves, fresh weight, dry weight, and ratio of header:root, chlorophyll content, (SOD) content, and zinc analysis in the growth medium. The conclusion of this study is that zinc (Zn) residue in the growth medium after the application of inorganic pesticides was 47.77 mg/kg, which decreased by 12.32% to 39.26 after the addition of biofertilizer. Plant responses after biofertilizer application in terms of growth parameters increased plant height and number of leaves, in terms of development accelerated flowering time, and in terms of productivity increased fresh weight, dry weight, and total plant weight, and increased chlorophyll content in the leaves. The activity of the Superoxide dismutase (SOD) enzyme in chili plants after biofertilizer application showed that chili plants were not stressed by inorganic pesticide residues, but the application of biofertilizer could increase the activity of the Superoxide dismutase (SOD) enzyme in chili plant leaves.

KEYWORDS : Biofertilizer, Bioremediation, Pesticides, Heavy metal, Zinc